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Lower Altitudinal Diversity Of Avian Fauna Of Kalimpong District Of West Bengal, India

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Abstract:

Birds are excellent indicators of the health of an ecosystem in a landscape and perform vital ecological roles such pollination, seed dispersal, pest control, and nutrient dynamics. In order to guarantee ecological functionality and ecosystem stability, biodiversity inventory and conservation, including landscape-level ecosystem restoration, have recently become top priorities worldwide. The purpose of this project is to establish a baseline database of avifaunal assemblages in the Kalimpong District of West Bengal at the lower altitudinal level.

A total of 56 bird species, representing 29 families, were documented. In terms of family diversity, Muscicapidae was the most prominent in the study area, with 9 species, followed by Picidae with 5 species. This study contributes valuable insights into the avian diversity of the region.

Key words: : Avian Fauna, species richness, Kalimpong, RDi

Introduction:

Birds are excellent indicators of the health of an ecosystem in a landscape and perform vital ecological roles such pollination, seed dispersal, pest control, and nutrient dynamics (Sekercioglu et. al., 2019; Wenny et .al., 2011). Unquestionably, birds are a promising indicator of an ecosystem's overall habitat quality. Bird population patterns can reveal information about how well an ecosystem functions when the birds rely on the environment to function in particular ways. When the landscape's composition, function, and transformation change, as well as when habitat structures become available, bird species respond swiftly (Tanveer et. al., 2002). In certain cases, a region's bird species composition—rather than just the number of birds—may indicate the habitat's quality (Paul., 2017). Of the approximately 9,990 bird species known to exist on Earth, 1,313 (more than 13%) are found on the Indian subcontinent (Datta., 2016). 1,375 bird species are listed as endangered with extinction worldwide in the most recent IUCN Red List review from 2015, with 84 of them species coming from India (Bird Life, 2016).

The north-eastern region of India possesses distinct environmental conditions and a variety of habitat types, attributable to its geographical location. This diversity has facilitated the flourishing of over 950 avian species, accounting for approximately 77% of the avifauna documented in India (Mahanta et. al., 2022). One of the global hotspots for biodiversity is the eastern Himalayas, which comprise portions of northern West Bengal and north-eastern Indian states (Mittermeier et al., 2005). North Bengal is a "Himalaya Biodiversity Hotspot," according to the IUCN, with over 30% of its higher plant species being native (Ghosh and Das, 2009). Two of the world's sixteen hotspot zones—the Eastern Himalayas and the Western Ghats—are located in India.

Despite its relatively small land area of 1,053.60 km^2, Kalimpong boasts a rich biodiversity, with a significant portion covered by forests and a remarkable diversity of birdlife, including approximately 550 different species. Kalimpong is one of the important biodiversity-rich areas of Eastern Himalayas. Neora Valley National Park, with an area of 88 square kilometres is located at the north-eastern face of the district and it comprises of a wet subtropical forest cover and dense temperate forest, making it a valuable asset on the whole nation (Kalimpong.gov.in, 2024). Moreover, NVNP has also been placed on the World Heritage nomination list (Mallick., 2010). The Neora Valley National Park, along with its lower tropical and subtropical forests, has been identified as one of the Important Bird Areas in the Eastern Himalayas by Birdlife International (WWF-US, Asia Program, 2005). In the context of the Eastern Himalayan region, NVNP and surrounding areas of Kalimpong Forest Division are environmentally significant park as they act as a biological route for animals travelling from other adjoining northern Bengal protected sites (Chettri et al., 2007; Wangchuk., 2007).

Unfortunately, anthropogenic disturbances are the main cause of the continuous decline in bird diversity worldwide (Roy. 2012). Changes in the world are seriously threatening the avian biodiversity (Sohil & Sharma., 2020). Therefore, it is essential for future conservation efforts to describe various bird communities, their distribution, preferred habitats, threats, conservation strategies, and regulations (Kandel et. al., 2018). Over the past few years, there is increasing number of species under threat due to human pressure leading to extensive destruction of the natural ecosystems of Kalimpong. By the end of this century it is estimated that about 90% of the forests of Himalaya will be exterminated extending many species to the verge of complete extinction (Pandit et al., 2007).

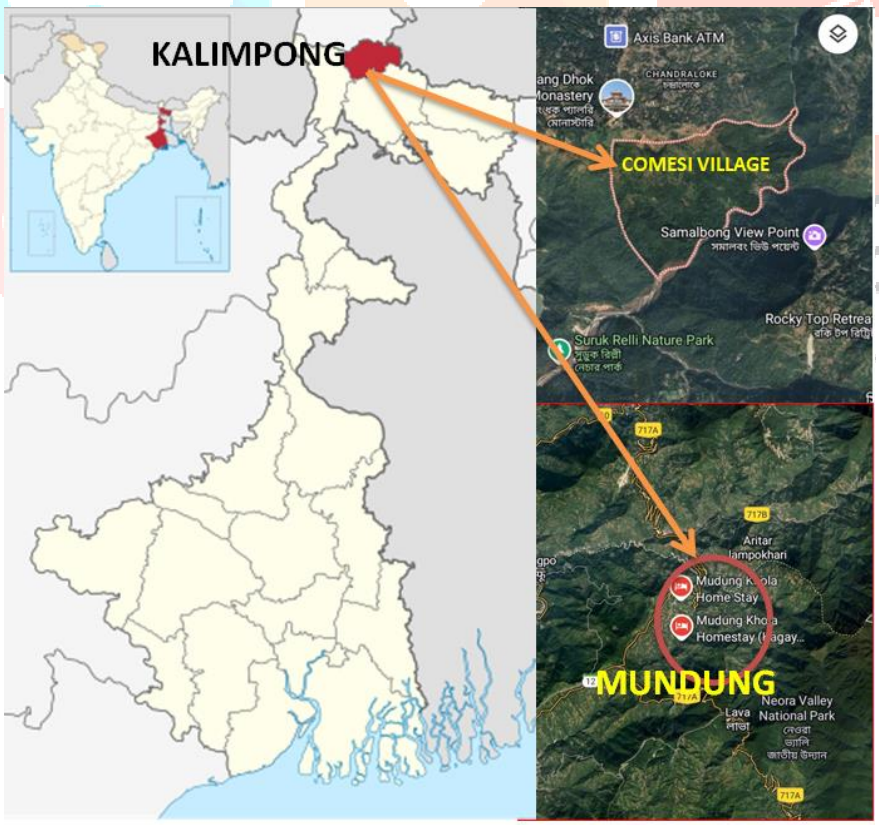

Fig 1: Map exhibiting study area of Mundung Khasmal and Comesi forest Village

Material and methods:

Study area-The Kalimpong district in West Bengal, situated at elevations ranging from 91 to 3,000 meters, showcases a landscape of terraced hills interspersed with verdant forests punctuated by springs. Two distinct locations were chosen for the study: the Mundung Valley and the Comesi Village Forest (Fig 1) which are below 1500 Meter from sea level. . The diverse habitats and rich avian fauna within this region have increasingly attracted both domestic and international birdwatchers. The Mundung valley has Mundung River and Relli River is only around 5km away from Comesi forest. Both the area are intersects by numerous spring water. The climate of the study area is classified as moist tropical monsoon, with temperatures ranging from 16°C to 34°C and an average annual rainfall between 2000mm and 3000mm (kalimpong.gov.in).

Table 1: Checklist and diversity of birds of Mundung Valley and the Comesi Village Forest

SN	Common Name	Scientific Name	IUCN status	Family	Availability	Occurrence
1	Eurasian Tree Sparrow	*Passer montanus*	LC	Passeridae	Common	R
2	Common Iora	*Aegithina tiphia*	LC	Aegithinidae	Uncommon	SV
3	Common Iora	*Aegithina tiphia*	LC	Aegithinidae	Common	R
4	Bengal Bush Lark	*Plocealauda assamica*	LC	Alaudidae	Uncommon	OV
5	Large Cuckooshrike	*Coracina macei*	LC	Campephagidae	Common	SV
6	Scarlet Minivet	*Pericrocotus flammeus*	LC	Campephagidae	Common	R
7	Small Minivet	*Pericrocotus cinnamomeus*	LC	Campephagidae	Common	R
8	Tailor Bird	*Orthotomus sutorius*	LC	Cisticolidae	Common	R
9	Common Tailorbird	*Orthotomus sutorius*	LC	Cisticolidae	Common	R
10	Grey Tree Pie	*Dendrocitta formosae*	LC	Corvidae	Common	R
11	House Crow	*Corvus splendens*	LC	Corvidae	Common	R
12	Common Hawk Cuckoo	Hierococcyx varius	LC	Cuculidae	Uncommon	OV
13	Asian Koel	*Eudynamys scolopaceus*	LC	Cuculidae	Common	OV
14	Green-billed Malkoha	*Rhopodytes tristis*	LC	Cuculidae	Uncommon	PM
15	Spangled Drongo	*Dicrurus bracteatus*	LC	Dicruridae	Common	R
16	Bronzed Drongo	*Dicrurus aeneus*	LC	Dicruridae	Common	SV
17	White-rumped Munia	*Lonchura striata*	LC	Estrildidae	Common	R
18	Long-tailed Broadbill	*Psarisomus dalhousiae*	LC	Eurylaimidae	Common	OV
19	Collared Falconet	*Microhierax caerulescens*	LC	Falconidae	Uncommon	OV

20	Red-rumped Swallow	*Cecropis daurica*	LC	Hirundinidae	Common	R
21	Long tailed Shrike	*Lanius schach*	LC	Laniidae	Common	R
22	Grey-backed Shrike	*Lanius tephrontus*	LC	Laniidae	Common	PM
23	Jungle Babbler	*Turdoides striata*	LC	Leiothrichidae	Common	R
24	Greater Necklaced Laughingthrush	*Pterorhinus pectoralis*	LC	Leiothrichidae	Common	WV
25	Rufous necked Laughingthrush	*Pterorhinus ruficollis*	LC	Leiothrichidae	Uncommon	SV
26	Plumbeous Water Redstart	*Rhyacornis fuliginosa*	LC	Muscicapidae	Common	R
27	White-capped Redstart	*Chaimarrornis leucocephalus*	LC	Muscicapidae	Common	R
28	Blue Whistling Thrush	*Myophonus caeruleus*	LC	Muscicapidae	Common	R
29	Oriental Magpie Robin	*Copsychus saularis*	LC	Muscicapidae	Common	R
30	Crested Serpent Eagle	*Spilornis cheela*	LC	Muscicapidae	Common	OV
31	Taiga Flycatcher	*Ficedula albicilla*	LC	Muscicapidae	Common	SV
32	Verditer Flycatcher	*Eumyias thalassinus*	LC	Muscicapidae	Common	R
33	White rumped shama	Copsychus malabaricus	LC	Muscicapidae	Common	R
34	Siberian Flycatcher	*Muscicapa sibirica*	LC	Muscicapidae	Uncommon	WV
35	Crimson Sunbird	Aethopyga siparaja	LC	Nectariniidae	Common	R
36	Green tailed Sunbird	Aethopyga nipalensis	LC	Nectariniidae	Common	R
37	Maroon Oriole	*Oriolus traillii*	LC	Oriolidae	Common	SV
38	Green-backed Tit	*Parus monticolus*	LC	Paridae	Common	R
39	Red-vented Bulbul	*Pycnonotus cafer*	LC	passerines	Common	R
40	Red Junglefowl	*Gallus gallus*	LC	Phasianidae	Common	R
41	Indian Pea Cock/Peafowl	*Pavo cristatus*	LC	Phasianidae	Common	R
42	Rufous Woodpecker	*Micropternus brachyurus*	LC	Picidae	Common	OV
43	Lesser Yellownape	*Picus chlorolophus*	LC	Picidae	Common	R
44	Greater Yellownape	*Picus flavinucha*	LC	Picidae	Common	R
45	Greater Goldenback	*Chrysocolaptes lucidus*	LC	Picidae	Common	R
46	Fulvous	Dendrocopos	LC	Picidae	Common	R

	breasted Woodpecker	macei				
47	Rose-ringed Parakeet	*Psittacula krameri*	LC	Psittacidae	Uncommon	R
48	Black-crested Bulbul	*Pycnonotus flaviventris*	LC	Pycnonotidae	Uncommon	R
49	Great Barbet	*Megalaima virens*	LC	Ramphastidae	Common	R
50	Blue-throated Barbet	*Megalaima asiatica*	LC	Ramphastidae	Common	R
51	Chestnut-bellied Nuthatch	*Sitta cinnamoventris*	LC	Sittidae	Common	R
52	Grey-headed Canary Flycatcher	*Culicicapa ceylonensis*	LC	Stenostiridae	Common	WV
53	Asian Barred Owlet	*Glaucidium cuculoides*	LC	Strigidae	Common	OV
54	Common Hill Myna	*Gracula religiosa*	LC	Sturnidae	Common	R
55	Common Myna	*Acridotheres tristis*	LC	Sturnidae	Common	R
56	Oriental WhiteEye	*Zosterops palpebrosus*	LC	Zosteropidae	Common	SV

Methods-Extensive avian surveys were conducted over the course of one year, from January 2024 to December 2024, in the research area using standard techniques, such as the point count method. In this method, the observer spends five minutes recording bird species observed and heard within a 50-meter radius from a randomly selected location. The survey is then repeated at a different site, at least 300 meters away. Additionally, opportunistic bird sightings were recorded while traveling within the study area (Nautiyal et. Al., 2015). Surveys and observations were conducted twice daily, during the peak activity periods of the avifauna (from 5:00 am to 11:00 am and 4:00 pm to 6:00 pm). Birds were observed using a Cason 10x50mm binoculars (with a 50mm objective lens and 10x magnification) and photographs were taken with a Nikon D500 camera (using Nikon AF-S 200-500/5.6 E VR and Nikon 50mm lenses). In addition to a camera and binoculars, a GPS device was used during the field survey for recording locations, gathering evidence, and identification. Bird calls were occasionally employed for bird identification. In addition to first-hand field observations, the second edition of the reference book *Birds of the Indian Subcontinent* by Grimmet et al. (2011), *The Book of Indian Birds* by S. Ali (2002) and *A pictorial field guide to Birds of India* by Grewal et. Al (2016) was used for bird species identification. Various light levels and other relevant literature were also reviewed.

Table: 2 The RDi (Relative diversity) of different families of bird in the research area.

SN	FAMILY NAME	NO OF SPECIES	RDi	SN	FAMILY NAME	NO OF SPECIES	RDi
1	Muscicapidae	9	16	16	Alaudidae	1	1.8
2	Picidae	5	8.9	17	Estrildidae	1	1.8
3	Campephagidae	3	5.4	18	Eurylaimidae	1	1.8
4	Cuculidae	3	5.4	19	Falconidae	1	1.8
5	Leiothrichidae	3	5.4	20	Hirundinidae	1	1.8
6	Aegithinidae	2	3.6	21	Oriolidae	1	1.8
7	Cisticolidae	2	3.6	22	Paridae	1	1.8
8	Corvidae	2	3.6	23	passerines	1	1.8
9	Dicruridae	2	3.6	24	Psittacidae	1	1.8
10	Laniidae	2	3.6	25	Pycnonotidae	1	1.8
11	Nectariniidae	2	3.6	26	Sittidae	1	1.8
12	Phasianidae	2	3.6	27	Stenostiridae	1	1.8
13	Ramphastidae	2	3.6	28	Strigidae	1	1.8
14	Sturnidae	2	3.6	29	Zosteropidae	1	1.8
15	Passeridae	1	1.8				

The residential status of the bird population was determined based on habitat type and categorized as follows: Regional (R) for species observed throughout the study period, Partial Migratory (PM) for species seen irregularly in the study area but recognized as resident species of India, Summer Visitor (SV) for species observed between June and August, Winter Visitor (WV) for birds detected only between December and February, and Occasional Visitor (OV) for species recorded once or twice during the survey.

The relative abundance of avian communities was classified as: 'C' for Common and 'UC' for Uncommon. The IUCN conservation status was categorized as: Near Threatened (NT), Vulnerable (VL), and Least Concern (LC) (Harde, et. al., 2020). The following formula was used to determine the percent of occurrence of families or relative diversity of families (Datta., 2016).

$$\text{Relative diversity} = \frac{\text{No of Species of each family}}{\text{Total no of different species seen}} \times 100$$

Result and Discussion:

The current study documented a total of 56 bird species, which were classified into 29 Families. Among these species, 36 were identified as resident or regional (R) birds, meaning they inhabit the area throughout the year, while the remaining 06 species were observed exclusively during the Summer season and were thus categorized as Summer visitors (SV) These 03 migratory species, recorded only in winter, were specifically designated as winter Visitor (WV), 08 species were recorded as Occasional visitor (OV), 02 species shows Partial Migration (PM) (Table 1). This finding underscores the ecological significance of the study area as a habitat for both resident and migratory bird populations, as well as the need for conservation efforts to protect species at risk.

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Fig 3: Some of the bird species found in the Mundung Valley and the Comesi Village Forest of Kalimpong District of West Bengal, India.

comparative analysis of the bird species across various families is presented in Table 2. The majority of the families were represented by a small number of species, with 15 families consisting of only one species, 9 families containing two species, and 3 families comprising three species. Notably, only one family was found to have as many as five and seven species. Among these, the Muscicapidae family emerged as the most dominant in the study area, with a Relative Diversity (RD) Index value of 16. This was followed by the Picidae family (RD Index value = 8.9), and the Campephagidae, Cuculidae and Leiothrichidae families with an RD Index value of 5.4. The remaining families exhibited lower relative diversity. The distribution and relative diversity of bird families are further illustrated in Table 2, providing a visual representation of the ecological composition and dominance patterns within the avian community of the region. This analysis highlights the varying levels of species richness across families and underscores the ecological significance of dominant families such as Muscicapidae in shaping the biodiversity of the area.

Conclusion:

Species checklists have been applied extensively for short-term biodiversity assessments, and they are considered to be effective for planning long-term conservation strategies. More in-depth analysis could be done in terms of finding additional species and how they are dispersed in different forest patches because this work was limited to a few forest fragments. Additionally, more focused and comprehensive studies are necessary to understand the impact of anthropogenic activities and climate change on the avian diversity in Kalimpong district of North West Bengal.

Reference:

1. Bird Life International. IUCN Red List for birds. 2015. http://www.birdlife.org/2015. Accessed on 06 June, 2016.
2. Chettri, N., Thapa, R., & Shakya, B. (2007). Participatory conservation planning in Kangchenjunga transboundary biodiversity conservation landscape. *Tropical Ecology*, *48*(2), 163.
3. Datta, M. (2016). Status, guild and diversity of avian fauna from a wetland site and surroundings, in Krishnagar, a City beside tropic of cancer, West Bengal, India. *International Journal of Fauna and Biological Studies*, *3*(4), 68-75.
4. Ghosh, C., & Das, A. P. (2009). On the occurrence of some endemic and rare ferns growing as Tea Garden weeds in Darjiling, India. *Indian Fern J*, *26*, 65-70.
5. Harde, S. N., Shinde, L. V., & Phalke, G. B. (2020). Diversity, Status and Abundance of Avian fauna in and around Jalna Urban, MS, India. *Int. J. Sci. Res. in Biological Sciences Vol*, *7*(6).
6. kalimpong.gov.in/flora-and fauna.
7. Kandel, P., Thapa, I., Chettri, N., Pradhan, R., & Sharma, E. (2018). Birds of the Kangchenjunga Landscape, the Eastern Himalaya: status, threats and implications for conservation. *Avian Research*, *9*, 1-13.
8. Mahanta, N., Islam, N., Barman, R., Deka, S., Borkataki, U., Chhetri, T., ... & Rahman, M. (2022). A preliminary checklist of avian fauna from Raimona National Park of Assam, India. *Applied Ecology and Environmental Sciences*, *10*, 652-664.
9. Mallick, J. K. (2010). Neora Valley-a new short-listed world heritage site. *Tiger paper*, *37*(3), 12-16.
10. Mittermeier, R.A., P.R. Gill, M. Hoffman, J. Pilgrim, T. Brooks, C.G. Mittermeier, J. Lamoreux and G.A.B. da Fonseca. 2005. Hotspots Revisited: Earth's Biologically Richest and most Endangered Terrestrial Ecoregions. CEMEX, Mexico.
11. Nautiyal, S., Bhaskar, K., & Khan, Y. I. (2015). Biodiversity of semiarid landscape. *Switzerland: Springer International Publishing*.
12. Pandit MK, Sodhi NS, Koh LP, Bhaskar A, Brook BW.2007. Unreported yet massive deforestation driving loss of endemic biodiversity in Indian Himalaya. Biodivers Conserv, 16:153– 63.
13. Paul, S. K., Roy, C., Chowdhury, K. D., & Dey, S. R. (2017). International Journal of Experimental Research and Review (IJERR). *Int. J. Exp. Res. Rev*, *11*, 52-55.
14. Roy, U. S., Banerjee, P., & Mukhopadhyay, S. K. (2012). Study on avifaunal diversity from three different regions of North Bengal, India. *Asian Journal of Conservation Biology*, *1*(2), 120-129.
15. Sekercioglu, Ç. H., Wenny, D. G., & Whelan, C. J. (Eds.). (2019). *Why birds matter: avian ecological function and ecosystem services*. University of Chicago Press.
16. Sohil, A., & Sharma, N. (2020). Assessing the bird guild patterns in heterogeneous land use types around Jammu, Jammu and Kashmir, India. *Ecological Processes*, *9*(1), 49.
17. Tanveer, A., Shahzad, M., & Chaudhry, A. A. (2002). Avian fauna of Punjab University, Lahore [Pakistan]. *Punjab University Journal of Zoology (Pakistan)*, *17*.
18. Wangchuk, S. (2007). Maintaining ecological resilience by linking protected areas through biological corridors in Bhutan.
19. Wenny, D. G., Devault, T. L., Johnson, M. D., Kelly, D., Sekercioglu, C. H., Tomback, D. F., & Whelan, C. J. (2011). The need to quantify ecosystem services provided by birds. *The auk*, *128*(1), 1-14.
20. WWF-US, Asia Program. 2005. Ecosystem profile: Eastern Himalayas Region. Final Version, February 2005. 97pp. Unpublished.